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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
ALI, MOHAMMAD	
ART UNIT	**PAPER NUMBER**
2177	

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/862,524	FRANZ ET AL.	
	Examiner	Art Unit	
	Mohammad Ali	2177	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 May 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14-22* is/are rejected.

7)☒ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

1. The application has been examined. Claims 1-22 are pending in this Office Action.

Drawings

2. The drawings filed on May 22, 2001 are objected by the Draftsperson under 37 CFR 1.84 or 1.152 , see attached PTO Form-948. Formal and corrected drawings will be required when the application will be allowed.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc. ***See MPEP § 608.01(b).***

In Page 21 line 4 the words "Disclosed" and "comprising" should not be in the Abstract disclosure.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-12 and 14-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Rosenbaum et al. ('Rosenbaum' hereinafter), US Patent 4,384,329.

With respect to claim 1,

Rosenbaum discloses a method of indexing a database of documents (col. 5, lines 29-36). Rosenbaum teaches 'providing a vocabulary of n terms' as receives an input word and uses the first four characters of the input word to search the vocabulary index in memory for the starting address in memory of the vocabulary data base segment containing the input word (see col. 4, lines 66 to col. 5, lines 3). Further, Rosenbaum discloses indexing the database in the form of a non-negative nxm index matrix V (see col. 2, lines 3-4). Rosenbaum teaches 'm is equal to the number of documents in the database' as data base structure includes devising a NXN binary matrix where N is equal to the number of words in the vocabulary (see col. 2, lines 2-4). Further, Rosenbaum teaches 'n is equal to the number of terms used to represent the database' as each vertical column in the matrix corresponds to the number of words in the synonym or antonym dictionary. Each row has a binary "1" bit set in the column position corresponding to each other word that is a synonym or antonym for the word defined by the row (see col. 2, lines 8-15 et seq). Rosenbaum teaches 'the value of

each element Vij of index matrix V is a function of the number of occurrences of the ith vocabulary term in the jth document' as synonym and antonym data base structures and text processing system control for interactively accessing these data base structures is implemented by devising a symmetric binary matrix storage organization which creates a word-wise relational data base linking the respective entries in a word list for retrieval while using minimum storage and without incurring entry redundancy (see col. 1, lines 62 to col. 3, lines 2 and Fig. 2). Rosenbaum teaches 'factoring out non-negative matrix factors T and D such that V=TD' as overall size of the matrix is reduced by run-length encoding the number of column positions between 1 bits in each row (col. 2, lines 15-17 et seq). Finally Rosenbaum teaches 'wherein T is an nxr term matrix, D is and rxm document matrix, and r<nm/(n+m)' as (see col. 2, lines 2-11 and col. 4, lines 55-64, Fig. 2).

As to claim 2,

Rosenbaum teaches 'deleting said index matrix V' as the vocabulary index access address is updated 'delete' at logic block by adding the displacement to the next word number. At logic block the vocabulary index number is tested to determine if all the synonyms for the input word have been accessed (see col. 5, lines 60-67).

As to claim 3,

Rosenbaum teaches deleting said term matrix T as the vocabulary index access address is updated 'delete' at logic block by adding the displacement to the next word number. At logic block the vocabulary index number is tested to determine if all the synonyms for the input word have been accessed (see col. 5, lines 60-67 et seq).

As to claim 4,

Rosenbaum teaches wherein r is at least one order of magnitude smaller than n (see col. 5, lines 1-35 et seq).

As to claim 5,

Rosenbaum teaches wherein r is from two to three orders of magnitude smaller than n (see col. 4, lines 55-64, Fig. 2 et seq) .

As to claim 6,

Rosenbaum teaches wherein entries of said document matrix D falling below a predetermined threshold value t are set to zero (see col. 5, lines 60-67).

As to claim 7,

Rosenbaum teaches wherein r is at least one order of magnitude smaller than n (see col. 5, lines 1-25 et seq).

As to claim 8,

Rosenbaum teaches wherein r is from two to three orders of magnitude smaller than n (see Abstract, col. 2, lines 56-67 et seq).

As to claim 9,

Rosenbaum teaches wherein entries of said document matrix D falling below a predetermined threshold value t are set to zero (see col. 5, lines 1-50 et seq).

As to claim 10,

Rosenbaum teaches wherein r is at least one order of magnitude smaller than n (see col. 5, lines 1-50).

As to claim 11,

Rosenbaum teaches wherein r is from two to three orders of magnitude smaller than n (see col. 5, lines 1-50 et seq).

As to claim 12,

Rosenbaum teaches wherein entries of said document matrix D falling below a predetermined threshold value t are set to zero (see col. 5, lines 33-51 et seq).

With respect to claim 14,

Rosenbaum discloses a program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for indexing a database of documents, said method steps comprising (see col. 5, lines 55-67, Fig. 2): Rosenbaum teaches 'providing a vocabulary of n terms' as receives an input word and uses the first four characters of the input word to search the vocabulary index in memory for the starting address in memory of the vocabulary data base segment containing the input word (see col. 4, lines 66 to col. 5, lines 3); Rosenbaum teaches 'indexing the database in the form of a non-negative nXm index matrix V' as (see col. 2, lines 3-4), wherein: m is equal to the number of documents in the database as (see col. 2, lines 3-4); Rosenbaum teaches 'n is equal to the number of terms used to represent the database' as synonym and antonym data base structures and text processing system control for interactively accessing these data base structures is implemented by devising a symmetric binary matrix storage organization which creates a word-wise relational data base linking the respective entries in a word list for retrieval while using minimum storage and without incurring entry redundancy

(see col. 1, lines 62 to col. 3, lines 2 and Fig. 2) ; and Rosenbaum teaches 'the value of each element v.sub.ij of index matrix V is a function of the number of occurrences of the i.sub.th vocabulary term in the j.sub.th document' as (see col. 5, lines 1-15); Rosenbaum teaches 'factoring out non-negative matrix factors T and D such that V.apprxeq.TD' as (see Abstract et seq); and Rosenbaum teaches 'wherein T is an n.times.r term matrix, D is an r.times.m document matrix, and r<nm/(n+m)' as (see col. 5, lines 1-15 et seq).

With respect to claim 15,

Rosenbaum discloses a database index (see col. 2, lines 3-4), comprising: Rosenbaum teaches 'an r.times.m document matrix D, such that V.apprxeq.TD wherein T is an n.times.r term matrix' as as data base structure includes devising a NXN binary matrix where N is equal to the number of words in the vocabulary (see col. 2, lines 2-4); Rosenbaum teaches 'V is a non-negative nXm index matrix , wherein each of its m columns represents an j.sup.th document having n entries containing the value of a function of the number of occurrences of a i.sup.th term appearing in said j.sup.th document; and wherein T and D are non-negative matrix factors of V and r<nm/(n+m)' as (see col. 5, lines 55-67 et seq); and Rosenbaum teaches 'wherein each of the m columns of said document matrix D corresponds to said j.sup.th document' as (see col. 5, lines 33-50 et seq).

With respect to claim 16,

Rosenbaum discloses a method of information retrieval, comprising (see col. 5, lines 55-67, Fig. 2): Rosenbaum teaches 'providing a query comprising a plurality of

search terms' as receives an input word and uses the first four characters of the input word to search the vocabulary index in memory for the starting address in memory of the vocabulary data base segment containing the input word (see col. 4, lines 66 to col. 5, lines 3); Rosenbaum teaches 'providing a vocabulary of n terms' as receives an input word and uses the first four characters of the input word to search the vocabulary index in memory for the starting address in memory of the vocabulary data base segment containing the input word (see col. 4, lines 66 to col. 5, lines 3); Rosenbaum teaches 'performing a first pass retrieval through a first database representation and scoring m retrieved documents according to relevance to said query' as synonym and antonym data base structures and text processing system control for interactively accessing these data base structures is implemented by devising a symmetric binary matrix storage organization which creates a word-wise relational data base linking the respective entries in a word list for retrieval while using minimum storage and without incurring entry redundancy (see col. 1, lines 62 to col. 3, lines 2 and Fig. 2); Rosenbaum teaches 'executing a second pass retrieval through a second database representation and scoring documents retrieved from said first pass retrieval so as to generate a final relevancy score for each document' as (see col. 5, lines 1-50 et seq); and Rosenbaum teaches 'wherein said second database representation comprises an rXm document matrix D, such that V.apprxeq.TD wherein T is an nXr term matrix' as (see col. 5, lines 55-67 et seq); Rosenbaum teaches 'V is a non-negative nXm index matrix , wherein each of its m columns represents an j.sup.th document having n entries containing the value of a function of the number of occurrences of a i.sup.th term of said vocabulary

appearing in said j.sup.th document' as (see col. 5, lines 1-15, Figs. 2-3); and Rosenbaum teaches 'wherein T and D are non-negative matrix factors of V and r<nm/(n+m)' as (see col. 2, lines 2-4 and col. 5, lines 1-15); and Rosenbaum teaches 'wherein each of the m columns of said document matrix D corresponds to said j.sup.th document' as (see col. 5, lines 55-67 et seq).

As to claim 17,

Rosenbaum teaches 'wherein said final relevancy score for any j.sup.th document is a function of said j.sup.th document s corresponding entry in said document matrix D and the corresponding entries in said document matrix D of the .GAMMA. top-scoring documents from said first pass retrieval' as (see col. 5, lines 33-50, Fig. 2).

As to claim 18,

Rosenbaum teaches 'wherein said relevancy score function for said j.sup.th document is proportional to a sum of cosine distances between said j.sup.th document s corresponding entry in said document matrix D and each of said corresponding entries in said document matrix D of the .GAMMA. top-scoring documents from said first pass retrieval' as (see col. 5, lines 33-50 et seq).

As to claim 19,

Rosenbaum teaches wherein r is at least one order of magnitude smaller than n (see Abstract et seq).

As to claim 20,

Rosenbaum teaches wherein r is from two to three orders of magnitude smaller than n (see col. 5, lines 1-15 et seq).

As to claim 21,

Rosenbaum teaches wherein entries of said document matrix D falling below a predetermined threshold value t are set to zero (see col. 5, lines 33-50).

With respect to claim 22,

Rosenbaum discloses a program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for information retrieval, said method steps comprising (see col. 1, lines 63 to col. 2, lines 24, Fig. 2): Rosenbaum teaches 'providing a query comprising a plurality of search terms' as receives an input word and uses the first four characters of the input word to search the vocabulary index in memory for the starting address in memory of the vocabulary data base segment containing the input word (see col. 4, lines 66 to col. 5, lines 3); Rosenbaum teaches 'providing a vocabulary of n terms' as receives an input word and uses the first four characters of the input word to search the vocabulary index in memory for the starting address in memory of the vocabulary data base segment containing the input word (see col. 4, lines 66 to col. 5, lines 3); Rosenbaum teaches 'performing a first pass retrieval through a first database representation and scoring m retrieved documents according to relevance to said query' as data base structure includes devising a NXN binary matrix where N is equal to the number of words in the vocabulary (see col. 2, lines 2-4); Rosenbaum teaches 'executing a second pass retrieval through a second database representation and scoring documents retrieved

from said first pass retrieval so as to generate a final relevancy score for each document; and wherein said second database representation comprises an r.times.m document matrix D, such that V.apprxeq.TD wherein T is an n.times.r term matrix' as (see col. 5, lines 1-50 et seq); Rosenbaum teaches 'V is a non-negative n.times.m index matrix, wherein each of its m columns represents an j.sup.th document having n entries containing the value of a function of the number of occurrences of a i.sup.th term of said vocabulary appearing in said j.sup.th document' as (see col. 5, lines 33-67, Fig. 2); and Rosenbaum teaches 'wherein T and D are non-negative matrix factors of V and r<nm/(n+m)' as (see col. 2, lines 3-4 et seq); and Rosenbaum teaches 'wherein each of the m columns of said document matrix D corresponds to said j.sup.th document' as (see col. 2, lines 2-11 and col. 4, lines 55-64, Fig. 2).

Allowable Subject Matter

6. Claim 13 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 4,823,306 issued to Barbic et al. teaches matrix and vocabulary.

Contact Information

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad Ali whose telephone number is (703) 605-4356. The examiner can normally be reached on Monday to Thursday from 7:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (703) 305-9790 or Customer Service (703) 306-5631. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306 for any communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-9600.

Mohammad Ali

Patent Examiner

AU 2177

MA

December 27, 2003